

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently amended) An isolated nucleic acid ~~sequence~~ coding for a polypeptide having acyl-CoA:lysophospholipid-acyltransferase activity, wherein the isolated nucleic acid comprises a nucleotide sequence having at least 80% identity to the nucleotide sequence of SEQ ID NO: 1, or encodes a polypeptide having at least 80% identity to the polypeptide sequence of SEQ ID NO: 2, wherein the acyl-CoA:lysophospholipid acyltransferase encoded by said nucleic acid ~~sequence~~ specifically converts C₁₆, C₁₈-, C₂₀- or C₂₂-fatty acids having at least one double bond in the fatty acid molecule.
2. (Currently amended) The isolated nucleic acid ~~sequence according to~~ of claim 1, ~~selected from the group consisting of:~~
 - ~~a) a nucleic acid sequence having wherein the nucleic acid comprises the nucleotide sequence depicted in~~ of SEQ ID NO: 1, ~~SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID NO: 7,~~
 - ~~b) nucleic acid sequences which can be derived from the coding sequence comprised in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID NO: 7 as a result of the degenerated genetic code,~~
 - ~~c) derivatives of the nucleic acid sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID NO: 7 which code for or encodes a polypeptide[[s]] having comprising the amino acid sequence depicted in~~ of SEQ ID NO: 2, ~~SEQ ID NO: 4, SEQ ID NO: 6 or SEQ ID NO: 8 and are at least 40% homologous at the amino acid level to SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6 or SEQ ID NO: 8 and have an acyl-CoA:lysophospholipid acyltransferase activity.~~
3. (Currently amended) The isolated nucleic acid ~~sequence according to~~ of claim 1, which is derived from a eukaryote.
4. (Withdrawn, currently amended) An amino acid sequence encoded by ~~[[an]]~~ the isolated nucleic acid ~~sequence according to~~ of claim 1.

5. (Currently amended) A gene construct comprising an the isolated nucleic acid ~~according to~~ of claim 1, wherein said nucleic acid is functionally linked to one or more regulatory signals.

6. (Currently amended) The gene construct ~~according to~~ of claim 5, ~~wherein the nucleic acid construct comprises~~ further comprising additional biosynthetic genes of the fatty acid or lipid metabolism, selected from the group consisting of acyl-CoA dehydrogenase(s), acyl-ACP[= acyl carrier protein] desaturase(s), acyl-ACP thioesterase(s), fatty acid acyltransferase(s), fatty acid synthase(s), fatty acid hydroxylase(s), acetyl-coenzyme A carboxylase(s), acyl-coenzyme A oxidase(s), fatty acid desaturase(s), fatty acid acetylenases, lipxygenases, triacylglycerol lipases, allenoxide synthases, hydroperoxide lyases ~~or~~ and fatty acid elongase(s).

7. (Currently amended) The gene construct ~~according to~~ of claim 5, ~~wherein the nucleic acid construct comprises~~ further comprising additional biosynthetic genes of the fatty acid or lipid metabolism, selected from the group consisting of $\Delta 4$ -desaturase, $\Delta 5$ -desaturase, $\Delta 6$ -desaturase, $\Delta 8$ -desaturase, $\Delta 9$ -desaturase, $\Delta 12$ -desaturase, $\Delta 5$ -elongase, $\Delta 6$ -elongase ~~or~~ and $\Delta 9$ -elongase.

8. (Currently amended) A vector comprising a the nucleic acid ~~according to~~ of claim 1, or a gene construct comprising said nucleic acid functionally linked to one or more regulatory signals.

9. (Withdrawn, currently amended) A transgenic nonhuman organism comprising at least one nucleic acid ~~according to~~ of claim 1, a gene construct comprising said nucleic acid functionally linked to one or more regulatory signals, or a vector comprising said nucleic acid or said gene construct.

10. (Withdrawn, currently amended) The transgenic nonhuman organism ~~according to~~ of claim 9, which organism is a microorganism, a nonhuman animal or a plant.

11. (Withdrawn, currently amended) The transgenic nonhuman organism ~~according to~~ of claim 9, which organism is a plant.

12. (Withdrawn, currently amended) A process for producing polyunsaturated fatty acids in an organism, wherein said process comprises ~~the following steps:~~

- a) introducing into ~~the~~ an organism at least one nucleic acid sequence ~~having the sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID~~

~~NO: 7, which sequence codes coding for a polypeptide having an acyl-CoA:lysophospholipid-acyltransferase activity; or~~

- ~~— b) — introducing into said organism at least one nucleic acid sequence which can be derived, as a result of the degenerated genetic code, from the coding sequence comprised in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID NO: 7, or~~
- ~~— c) — introducing into said organism at least one derivative of the nucleic acid sequence depicted in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5 or SEQ ID NO: 7, which code for polypeptides having the amino acid sequence depicted in SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6 or SEQ ID NO: 8 and which are at least 40% homologous at the amino acid level to SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6 or SEQ ID NO: 8 and have an equivalent acyl-CoA:lysophospholipid-acyltransferase activity, and~~
- d) culturing and harvesting said organism,

wherein the nucleic acid comprises a nucleotide sequence selected from the group consisting of:

- i) the nucleotide sequence of SEQ ID NO: 1,
- ii) a nucleotide sequence having at least 80% identity to the nucleotide sequence of SEQ ID NO: 1,
- iii) a nucleotide sequence encodes the polypeptide sequence of SEQ ID NO: 2, and
- iv) a nucleotide sequence encodes a polypeptide having at least 80% identity to the polypeptide sequence of SEQ ID NO: 2.

13. (Withdrawn, currently amended) ~~[[A]] The process for producing polyunsaturated fatty acids according to of claim 12, wherein, in addition to the nucleic acid sequences mentioned under (a) to (c), the process further comprises introducing additional nucleic acid sequences have been introduced into said organism, which wherein the additional nucleic acid sequences code for polypeptides of the fatty acid or lipid metabolism[[,]] selected from the group consisting of acyl-CoA-dehydrogenase(s), acyl-ACP[= acyl carrier protein] desaturase(s), acyl-ACP thioesterase(s), fatty acid acyltransferase(s), fatty acid synthase(s), fatty acid hydroxylase(s),~~

acetyl-coenzyme A carboxylase(s), acyl-coenzyme A oxidase(s), fatty acid desaturase(s), fatty acid acetylenases, lipoxygenases, triacylglycerol lipases, allenoxide synthases, hydroperoxide lyases or and fatty acid elongase(s).

14. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein, ~~in addition to the nucleic acid sequences mentioned under (a) to (e), the process further comprises introducing additional~~ nucleic acid sequences ~~have been introduced into the organism, which wherein the additional nucleic acid sequences~~ code for polypeptides selected from the group consisting of $\Delta 4$ -desaturase, $\Delta 5$ -desaturase, $\Delta 6$ -desaturase, $\Delta 8$ -desaturase, $\Delta 9$ -desaturase, $\Delta 12$ -desaturase, $\Delta 5$ -elongase, $\Delta 6$ -elongase or and $\Delta 9$ -elongase activity.

15. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein C_{16} -, C_{18} -, C_{20} - or C_{22} -fatty acids are used as substrate of the acyl-CoA:lysophospholipid acyltransferases.

16. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein the polyunsaturated fatty acids are isolated from the organism in the form of an oil, lipid or a free fatty acid.

17. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein the polyunsaturated fatty acid produced in said process is a C_{18} -, C_{20} - or C_{22} -fatty acids having at least two double bonds in the molecule.

18. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein ~~[[a]] the polyunsaturated fatty acid produced is selected from the group consisting of~~ dihomono- γ -linolenic acid, arachidonic acid, eisosapentaenoic acid, docosapentaenoic acid and or docosahexaenoic acid ~~is produced in said process.~~

19. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein the organism is a microorganism, a nonhuman animal or a plant.

20. (Withdrawn, currently amended) The process ~~for producing polyunsaturated fatty acids according to~~ of claim 12, wherein the organism is a transgenic plant.

21. (Withdrawn, currently amended) The process for ~~producing polyunsaturated fatty acids according to~~ of claim 20, wherein the transgenic plant is an oil crop plant.
22. (Withdrawn, currently amended) An oil, a lipid or a fatty acid or a fraction thereof, prepared by the process ~~according to~~ of claim 12.
23. (Withdrawn, currently amended) An oil composition, a lipid composition or a fatty acid composition which comprises polyunsaturated fatty acids ~~prepared by a process according to~~ produced by the process of claim 12 and is derived from transgenic plants.
24. (Canceled)
25. (Withdrawn, currently amended) A method of making feed, foodstuffs, cosmetics or pharmaceuticals comprising incorporating the polyunsaturated fatty acids prepared according to prouced by the process of claim 12, or an oil composition, a lipid composition, or a fatty acid composition comprising said polyunsaturated fatty acids that are derived from transgenic plants in said feed, foodstuffs, cosmetics or pharmaceuticals.
- 26-29. (Cancelled)
30. (New) The isolated nucleic acid of claim 1, wherein the nucleic acid comprises a nucleotide sequence having at least 90% identity to the nucleotide sequence of SEQ ID NO: 1, or encodes a polypeptide has at least 90% identity to the polypeptide sequence of SEQ ID NO: 2.
31. (New) The isolated nucleic acid of claim 1, wherein the nucleic acid comprises a nucleotide sequence having at least 95% identity to the nucleotide sequence of SEQ ID NO: 1, or encodes a polypeptide has at least 95% identity to the polypeptide sequence of SEQ ID NO: 2.
32. (New) The process of claim 12, wherein the nucleic acid comprises a nucleotide sequence having at least 90% identity to the nucleotide sequence of SEQ ID NO: 1, or encodes a polypeptide having at least 90% identity to the polypeptide sequence of SEQ ID NO: 2.
33. (New) The process of claim 12, wherein the nucleic acid comprises a nucleotide sequence having at least 95% identity to the nucleotide sequence of SEQ ID NO: 1, or encodes a polypeptide having at least 95% identity to the polypeptide sequence of SEQ ID NO: 2.